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Firm Attributes and Real Activity Manipulation among Public Industrial Companies in Nigeria

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Abstract: Evidences have shown that real activity manipulation (RAM) is an endemic problem present in both developing and developed countries. Most importantly, the influence of corporate attributes upon RAM cannot be over-emphasized. Therefore, this study evaluated the effect of corporate attributes on RAM. The study employed ex-post facto research design, collecting published facts of figures from the financial statements of 56 purposively selected public Nigerian non-financial companies (NFC). The published data obtained were subjected to panel data regression. The outcomes of this investigation showed thus: capital intensity exhibited increasing and cogent influence upon RAM of public Nigerian NFC (coefficient = 0.7919, t-value = 6.5300, and p-value < 0.05); company largeness influence on RAM of public Nigerian NFC was favourable and not cogent (coefficient = 0.0115, t-value = 0.5072, and p-value > 0.05); and profitability had decreasing and cogent influence upon RAM of public Nigerian NFC (coefficient = -0.8494, t-value = -5.0709, and p-value < 0.05). The study concluded that firm attributes systematically affected the RAM of the sampled firms in Nigeria. Therefore, the investigation advised that firms should manage their profitability and leverage so as to reduce pressure on retained earnings.

Key words: Real Activity Manipulation, Capital Intensity, Company Largeness, Profitability.

Introduction

Real activity manipulation (RAM) has profoundly affected the economies of developed, developing nations and Nigeria. Understanding RAM is one of the challenges that European emerging countries' economic development has faced over the past 20 to 30 years, particularly for their entry into the European Union and inclusion in OECD countries (Durana, Valaskova, Siekelova & Michalkova, 2022). RAM is the term used to describe deviations from standard operating procedures that managers make in an effort to deceive at least some stakeholders into thinking that specific financial reporting objectives

have been achieved naturally (Habib, Ranasinghe, Wu, Biswas & Ahmad, 2022). RAM examples include, but are not limited to, overproduction intended to lower cost of goods sold and reducing R & D expenditure to increase current-period profits. Due to the increased likelihood that auditors and regulatory bodies will identify accrual earnings management (AEM), managers are increasingly using RAM, especially in the post-SOX era (Habib, *et al.*, 2022).

RAM is a major problem for today's researchers and has gained a lot of attention in the last ten years. This verifies the nearly 3,500 research articles published in Web of Science Core Collection and more than 2,000 in Scopus in the last three years (Durana, *et al.*, 2022). AEM, such as aggressive revenue recognition and understating of inventories or accounts due, etc., receives a lot of attention. In addition to using accruals to influence earnings, businesses may also take or postpone operational or production decisions that will move the earnings in the direction they want. Management of "real" profits is the latter kind. RAM, in contrast to AEM, is more likely to result in value reduction through improper allocation of necessary company activities. Managers are conscious that in order to meet the desired values of short-term indicators and keep appropriate corporate performance, they must accept a certain loss of future cash flow when employing earnings management (EM) models and tactics (Guluma 2021).

The misuse of earnings has led to the demise of illustrious businesses like Enron, WorldCom in the US, and Transmile in Malaysia. The same is true for Nigeria, where recent business scandals in 2017 have involved organizations like Oando Oil Plc and Arik Airlines (Olowokudejo & Oladimeji, 2019). In Nigeria, RAM also led to the collapse of such companies as Cadbury Nigeria Plc, Skye Bank Plc, Intercontinental Bank Plc, etc. Firm attributes are features that are peculiar to a firm which distinguishes one firm from another. These features affect the scale of operations of a firm (Saheed & Babatunde, 2022). Firm size or company largeness (FSIZE), profitability (PROF), liquidity or current asset divided by current liabilities (LIQ), leverage or total debt divided by total asset (LEV), capital intensity (CAPINT) and company age (AGE) were the firm attributes considered in this study. Prior studies (Saheed & Babatunde, 2022; Edi & Jessica, 2020) had established the effect of the above firm attributes on RAM

Most of the previous studies (Echobu, Audi & Mailafia, 2019; Dachomo & Bala, 2020) considered the effect of firm attributes on AEM to the neglect of RAM. They also failed to consider the effect of CAPINT and AGE on RAM. The current study was intended to fill these research gaps. In the Annual Reports and Accounts for 2005 of Cadbury Nigerian Plc, the Nigerian Securities and Exchange Commission (SEC) identified poor performance, deteriorating total debt divided by total asset ratio, insufficient publication, and poor liquidity as factors contributing to the company's decline (Okaro & Okafor, 2021). Cadbury (Nig.) Plc engaged in risky EM by acquiring loans to pay dividends to shareholders while using capital receipts to cover revenue expenditure.

Considering the above problem statement, the study therefore, raises the questions that follow:

- (i) what is the extent of the influence of capital intensity on the RAM of public Nigerian non-financial companies (NFC)?
- (ii) what is the influence of company largeness on RAM of public Nigerian NFC?
- (iii) how does profitability affect RAM of Nigerian public NFC?

The broad aim of this research is to investigate the influence of firm attributes on RAM of public Nigerian NFC. Specifically, the research is to:

- (i) investigate the influence of capital intensity on RAM of public Nigerian NFC;
- (ii) examine the effect of company largeness upon RAM of public Nigerian NFC;
- (iii) explore how profitability affect RAM of public Nigerian NFC.

The hypotheses of this study are stated in null form as shown below:

H₀₁: The effect of capital intensity on RAM of public Nigerian NFC is not cogent.

H₀₂: The influence of company largeness on RAM of public NFC in Nigeria is not cogent.

H₀₃: The effect of profitability on RAM of public Nigerian NFC is not cogent.

Apart from the above introduction, the study had four other sections. Section two covered literature review while section three covered methodology adopted in this study. Data presentation, analysis and interpretation were dealt with in section four while section five dealt with summary, conclusion and recommendation.

Literature Review

Conceptual Review

Real Activity Manipulation

In contrast to AEM methods and their reliance on accounting measures, the less popular RAM practice is carried out through operational decisions that have a direct effect on a firm's cash flow. Roychowdhury (2006) cited in Al-Harby & Jarraya (2022) emphasizes the intention to purposefully mislead stakeholders as management engages in business actions that do not correspond to the normal course of operations, causing a misunderstanding of the actual performance of the firm. This is in line with the ideas of Healy and Wahlen (1999). Real activity manipulation, according to Roychowdhury (2006), is when managers deviate from standard operating procedures in an effort to deceive at least some stakeholders into thinking that specific financial reporting objectives have been achieved naturally. These departures do not necessarily contribute to firm value even though they enable managers to meet reporting goals. Certain real activities manipulation methods, such as price discounts and reduction of discretionary expenditures, are possibly optimal actions in certain economic circumstances.

A broad range of operational choices are used to manipulate real activities. These operational choices might not be the best ones to make, which would eventually hurt the company's operating success. For instance, offering price reductions to increase current year profits may result in lower cash inflows going forward. Real activities manipulation can reduce firm value because actions taken in the current period to increase earnings can have a negative impact on cash flows in future periods. Customers may come to anticipate these discounts in the future if, for instance, aggressive price reductions are made to boost sales and meet short-term earnings targets. Lower revenue margins in the future may result from this. Overproduction generates excess inventories that have to be sold in subsequent periods and imposes greater inventory holding costs on the company (Roychowdhury, 2006).

Firm Attributes

Firm attributes were the firm-specific characteristics that had direct impact or influence on firm performance, and EM. Studies (Park, Sung-kyoo & Sangryul, 2021; Khanh & Khuong, 2018; Edi & Jessica, 2020; Al Matbouly, 2021) had established that certain firm characteristics had a direct bearing on the firm performance and EM. On top of governance practices, firms' characteristics had been empirically linked to efficiency of operations of a firm. Al Matbouly (2021) noted that two firms with similar firm attributes and facing similar operational conditions were presumed to have the same value and same rating as in EM. However, a firm might be priced lower than the other implying that one firm was less efficient.

Firm attributes were critical in Nigeria (a developing/emerging economy) given the fact that majority of the firms are micro, small, and medium enterprises (Adenugba, Ige & Kesinro, 2016). Although, a lot of studies existed on the association between firm attributes and EM in developed economies, most notably

the United States of America, Russia and France; the same was not true in developing economies like Nigeria where there was a relatively paucity of literature in this area, coupled with the huge institutional differences between Nigeria and developed economies. Firm attributes were factors that were mostly under the control of management. The firm attributes included firm size, liquidity, leverage, sales growth, and firm age. This implied that the EM of non-financial firms could be ascertained using firm specific attributes.

Theoretical Review

Agency theory was used to underpin this study. Therefore the study reviewed Agency theory.

Agency Theory (AT)

The first researchers to explicitly advocate for the formation of the theory of agency and to actually initiate that process were Stephen Ross and Barry Mitnick. They did it independently and roughly at the same time (Uwaubani, 2019). Although the fundamental ideas underpinning the two approaches were similar, Ross was in charge of developing the economic theory of agency while Mitnick was in charge of developing the institutional theory of agency.

It was crucial to remember that a number of explicit and crucial assumptions regarding the behavior of the agents served as the foundation for agency theory. Regarding the presumptions made about the agents, agency theorists explicitly mentioned the issue of opportunism. Opportunism was viewed as a cunning form of self-interest (Williamson, 1975). Therefore, it was anticipated that the economic actors would conceal, falsify, deceive, or scam one another as they entered into a trade. Even with the provision of incentives and oversight, it was expected that opportunism might still win out due to moral hazard or adverse selection.

Additionally, the agency theory predicted that agents will act in a risk-expelling manner while making judgements. Nevertheless, agency theorists view variations from risk-expelling as aberrations and confusions that were the exception rather than the rule. When confronted with confusions on the maximizing of expected utility, agency researchers saw examples of non-risk-expelling choices (where agents were risk-pursuers or risk-friendly) as either unique occurrences of agent behavior (Jensen & Meckling, 1976) or plain disgusting (Arrow, 1971). Since the principal might diversify his investments, the assumption of risk cautiousness was modified in agency theory with respect to the shareholders but not the agent. Given that he could only hold one position as CEO at once, it was expected that the agent (the CEO) would be risk cautious (Wright, Mukherji & Kroll, 2001).

Additionally, according to AT, the principal (scattered shareholders) and the agent (management, CEOs) had different goals, used information in different ways (the shareholders could not monitor the management's activities but was aware of the facts of figures the management had), and had different inclinations toward risk (Radovic, 2008). Since each would seek to optimise his benefits, the interests of the shareholders and management differed.

The literature had listed the problems with agency theory. First off, agency theory was overly abstract and its abstraction was unrepresentative of reality (Band, 1992). Human behavior was oversimplified by agency theory. It was a theory that neglected environmental and social context and was methodologically unfalsifiable due to its irrational presumptions that people maximized their own personal pursuits. AT was too mechanical (Arrow, 1971), for it assumed that agent-principal relationships were exclusively hinged on commercial pursuits. When accounting practice changed depending on the social, cultural, and political context, AT was unable to explain these changes. This criticism had the consequence that a researcher undertaking accounting research should not rely entirely on agency theory; instead, the theory should be supported by other theories (Eisenhardt, 1989).

The link between investors and management is examined in AT. The investors agreed to reward the managers for completing specific tasks for the investors (Jensen & Meckling, 1976).

It was stated that managerial behavior did not necessarily maximize the profits to the shareholders in a business when share ownership was widely distributed (Donaldson & Davis, 1991). An investor would be exposed to agent risk if there was any doubt about whether the agent would operate in his or her best interests rather than those specified in the contract (Fiet, 1995).

As regard the application of agency theory to this study, the managers (CEOs) of business organisations that practice EM were the agents of the principals (the shareholders) that employed them. The managers took advantage of the existence of information asymmetry to act opportunistically to practice EM to their advantage to the detriment of other stakeholders.

Empirical Review

Naz and Sheikh (2023) used GMM to examine the effect of capital structure on RAM and AEM of NFC of Pakistan Market. They found that total debt ratio, long-term debt ratio and short-term debt ratio had favourable effect on abnormal cash flow from operations.

Irom, Okpanachi, Ahmed and Agbi (2023) made use of quantile regression analysis to investigate the effect of managerial ownership and audit committee accounting knowledge on EM of public manufacturing companies in Nigeria. They found that managerial ownership effect on RAM was cogent.

Egbunike, Igbinovia, Okafor and Mmadubuobi (2023) studied the effect of residual audit fee on real income smoothing of public NFC using GMM. The findings revealed that the influence of residual audit fee on operating cash flow smoothing and production expenditure smoothing was adverse and cogent.

Kabwe (2023) examined the effects of corporate governance attributes on financial reporting quality (FRQ) of Zambian public businesses. The results showed that board size had favourable and cogent effect on FRQ.

Efenyumi and Okoye (2022) employed OLS analysis to expound the influence of independence and diligence on earnings quality of public companies. They found that the influence of risk management committee characteristics was not substantial on the profitability of public companies.

Elhaj, Mansor and Salleh (2022) examined the effects of Risk Management Committee (RMC) attributes on RAM practice in public companies of Malaysia using Feasible Generalised Least Square (FGLS) regression. They found that RMC size, diligence and members' qualifications had adverse influence on RAM.

Akenroye, Adegbe and Owolabi (2022) used ex-post facto research design and multiple regression to examine the effect of corporate characteristics on profitability of chosen public firms in Nigeria. They found that the joint effect of corporate features on Net Profit Margin was cogent.

Studying business characteristics and RAM in Nigeria, Saheed and Babatunde (2022) used GMM estimator to discover that asset structure, capital structure and firm profitability had favourable and cogent effects on RAM. They also found that the effects of free cash flow, dividend payout ratio, working capital, firm size and growth opportunity on RAM were adverse but cogent.

Saliha, Naziha and Nesrine (2022) used multiple regression analysis to examine the effects of profitability and business characteristics on EM. They found that the effect of profitability on EM was favourable while the effects of financial leverage, asset structure, growth rate and sectoral affiliation were adverse.

Bello, Garba and Gimba (2021) investigated the effect of characteristics of board of directors on RAM of Nigerian public companies that produced consumer goods. The effects of board size and board accounting knowledge on RAM were found to be adverse and cogent.

In summary, prior study (Egbunike, Igbinoia, Okafor & Mmadubuobi, 2023) used GMM to carry out their investigation; the current study used Random Effect of multiple regression to investigate the effect of firm attributes on RAM, a method that was more revealing than GMM. The above prior study considered operating cash flow smoothing and production expenditure smoothing separately and severally to the neglect of discretionary expenditure smoothing. The current study employed the combined effect of operating cash flow smoothing, production expenditure smoothing and discretionary expenditure smoothing together as RAM.

Methodology

Research Design

The investigation used an ex-post facto research design, gathering and analyzing published figures contained in the financial statements of Nigerian public NFC. The researcher was unable to change the data; instead, he used it exactly as it appeared in the Nigerian public NFC' financial statements.

Population of the Study

All public NFC on the NSE, a division of the Nigerian Exchange Group, between 2003 and 2020, comprised the investigation sample space. 105 NFC were on the NSE throughout the analysis's time frame.

Sample Size and Sampling Technique

The study employed the formula for "Small Sample Techniques" of Krejcie and Morgan (1970) to select the subset size for the secondary data. Employing the formula, a total of ninety (90) public Nigerian NFCs were selected as the subset size out of the total of one hundred and five (105). The ratio of the number of companies in each sector to 105 companies forms the basis of selecting the subset size. However, only 56 out of the 90 companies were selected which accounted for 62%.

Sources of Data and Data Collection Method

Through text analysis, published figures were gathered from the financial statements of 56 Nigerian public NFC between 2003 and 2020.

Model Specification

Based upon literature review, the following model was specified for the relationship between firm attributes and RAM:

$$RAM = f(\text{firm attributes}) \dots\dots\dots 3.1$$

$$RAM = f(\text{Firm size, Firm financial leverage, Firm profitability, Firm liquidity, Firm capital intensity, Firm age, Sales growth, and Asset growth}) \dots\dots\dots 3.2$$

The study then transformed equation 3.2 into the following linear equation:

$$RAM_{jt} = \beta_{0jt} + \beta_1 FSIZE_{jt} + \beta_2 LEV_{jt} + \beta_3 PROF_{jt} + \beta_4 LIQ_{jt} + \beta_5 CAPINT_{jt} + \beta_6 AGE_{jt} + \beta_7 SG_{jt} + \beta_8 AG_{jt} + \mu_{jt} \dots\dots\dots 3.3$$

Where:

Table 3.1 Model Variables and their Definitions

Variables	Definitions
RAM_{jt}	Real Activity Manipulation
$FSIZE_{jt}$	Size of the firm
LEV_{jt}	Financial leverage level
$PROF_{jt}$	Profitability
LIQ_{jt}	Liquidity ratio
$CAPINT_{jt}$	Capital intensity
AGE_{jt}	Company age
SG_{jt}	Sales growth
AG_{jt}	Asset growth
B_0	Intercept
β_1 to β_8	Coefficients
μ_{jt}	Error term

Source: Author's conceptualisation (2023)

Method of Data Analysis

Descriptive and inferential statistics were used to analyze published figures taken from the financial statements of Nigerian public NFCs for the years 2003 to 2020.

The descriptive statistics that were used in this study included average, standard deviation (Std. Dev.), minimum (MIN) and maximum (MAX) values. While the average was used to have a snapshot of the magnitude of the data, the Std. Dev. measured the variation of values for each variable to determine the reliability of the average. The range of values for each variable was shown with the help of MIN and MAX.

Correlation analysis, which was a prerequisite for longitudinal cum cross-sectional data regression analysis to determine the degree of multicollinearity among the variables (Gujarati, 2003) was also used to determine the potency of a linear relationship between firms' attributes and RAM. The study conducted other preliminary tests such as variance inflation factor (VIF) and panel unit root test.

Panel data regression (PDR) constituted the inferential statistic that was employed in this study. The PDR model was divided into three models, namely Common Effect model (CE), Fixed Effect model (FE) and Random Effect model (RE). Of the three models, the most appropriate model was chosen based on the characteristics of the data to answer the objectives of the study.

Results and Discussion of Findings

Descriptive Statistics of the Variables

The variables' descriptive statistics are displayed in Table 4.1. Understanding the properties of the variables before analysis is critical since it will help to reduce the presence of outliers that can result in an inaccurate model estimate.

Table 4.1: Descriptive Statistics of the Variables

	Average	Median	MAX	MIN	Std. Dev.
CAPINT	0.4570	0.4040	3.9324	0.0000	0.3373
AGE	74.9464	74.0000	135.0000	15.0000	35.0206
FSIZE	15.7023	15.7175	21.2979	9.8313	1.9974
PROF	0.0570	0.0560	3.3282	-1.3074	0.2314
AG	1.0524	0.9220	11.9397	-17.9205	2.4599

SG	0.2377	0.0013	59.6410	-3.0243	3.2405
LEV	1.9657	1.0535	98.8129	-68.0420	9.6926
LIQ	0.5225	0.1696	161.5849	-141.7600	10.7906

Source: Author's Computation (2023)

As shown in Table 4.1, CAPINT variable reported average of 0.4570 and Std. Dev. of 0.3373. The average was more than the Std. Dev, which implied that CAPINT, as a variable, exhibited low degree of disparity. AGE had the mean of 74.9464 and Std. Dev. of 35.0206. In the same vein, the sample average of the FSIZE was 15.7023 with Std. Dev. of 1.9974. More so, the result of the descriptive statistics showed that average profitability, AG, SG, LEV, and LIQ of the selected firms were 0.0570, 1.0524, 0.2377, 1.9657, and 0.5225 respectively.

Pre-estimation Tests

The following pre-estimation tests were carried out. They included correlation matrix, VIF, and panel unit root test.

Correlation Matrix

Table 4.2 displayed the variables' correlation matrix. In order to determine the degree of link between the variables, the study performed a correlation analysis on them.

Table 4.2: Correlation Matrix of the Variables

	CAPINT	AGE	FSIZE	PROF	AG	SG	LEV	LIQ
CAPINT	1							
AGE	0.0131	1						
FSIZE	-0.1302	0.0235	1					
PROF	-0.1529	-0.0681	0.1717	1				
AG	0.0677	-0.0391	0.1634	0.0786	1			
SG	-0.0129	-0.021	-0.0958	-0.0647	-0.0083	1		
LEV	-0.0300	-0.0382	0.0671	-0.0061	0.233	-0.0008	1	
LIQ	-0.0528	0.1047	-0.0412	0.0159	-0.005	0.345	0.0056	1

Source: Author's Computation (2023)

As shown in Table 4.2, all the variables (CAPINT, AGE, FSIZE, PROF, LEV, LIQ, AG and SG) did not exhibit strong correlation with each other.

VIF

In order to exhumate the problem of multi-collinearity that may not be evident in the correlation matrix presented in Table 4.2, further collinearity review was carried out by calculating VIF coefficients (Table 4.3).

Table 4.3: VIF

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
AG	0.0001	1.7923	1.5059
AGE	3.24E-0	3.6178	1.0079
CAPINT	0.0036	3.0076	1.0579
FSIZE	0.0001	1.8201	1.0843
LEV	6.13E-0	1.5207	1.4595
LIQ	1.21E-0	3.5769	3.5685

PROF	0.0078	1.1417	1.0739
SG	0.0001	3.6149	3.5955

Source: Author's Computation (2023)

According to the Table 4.3 test's findings, none of the variables utilized in the model's estimation had a VIF greater than 10, which suggested that multicollinearity was not an issue with any of the model's variables. If a variable's VIF is greater than 10, then there is a problem with multicollinearity.

Panel Unit Root Test

The study used the LLC and LPS test methods as shown in Table 4.4 to conduct the panel unit root test in order to prevent the issue of false regression.

Table 4.4: Panel Unit Root Test

Variable	LLC		LPS		Order of Integration
	Statistics	p-value	Statistics	p-value	
CAPINT	16.2458	0.0000	10.4460	0.0000	I(0)
AGE	19.3241	0.0000	11.4634	0.0000	I(0)
FSIZE	16.0614	0.0000	9.6848	0.0000	I(0)
PROF	17.9029	0.0000	13.5229	0.0000	I(0)
AG	22.4301	0.0000	15.1256	0.0000	I(0)
SG	10.1030	0.0000	8.9434	0.0000	I(0)
LEV	20.3513	0.0000	10.6462	0.0000	I(0)
LIQ	19.9709	0.0000	7.2805	0.0000	I(0)

Source: Author's Computation (2023)

The test's findings, which are shown in Table 4.4, demonstrated that none of the variables had unit root at level issues. This suggested that all the variables were level and stationary.

Restatement and Testing of Hypotheses

In order to answer the research questions, the following hypotheses were tested:

H₀₁: The impact of capital intensity on RAM of public NFC in Nigeria is not cogent.

H₀₂: The effect of company largeness on RAM of public NFC in Nigeria is not cogent.

H₀₃: The influence of profitability on RAM of public NFC in Nigeria is not cogent.

This section reported the effect of firm attributes on the RAM among the sampled firms in Nigeria. Hausman test was carried out in order to choose the best fit model between fixed and random effect model. The test statistics of Hausman test = 5.1094, $p = 0.7458$ indicated that random effect was the appropriate model for the relationship between firm attributes and RAM. However, having discovered that random effect was the best model among the assumption, it was imperative to explore the post estimation diagnostic test of the model. The study conducted heteroskedasticity test of the model. The outcome of the test as reported in the Table 4.5 showed that the model was free from the problem of heteroskedasticity. A model is homoskedasticity when the p-value of the test statistics is greater than 0.05. The result of the test statistics of the heteroskedasticity test was greater than 0.05, therefore, the model is homoskedasticity. More so, Table 4.5 reported the test for autocorrelation of the model. A model is free from the autocorrelation problem when the p-value of the test statistics is greater than 0.05. In this case the p-value of Serial Correlation Test was greater than 0.05. Therefore, the result showed that the model was free from the problem of autocorrelation.

In line with the diagnostics result, it was obvious that the assumption of homoscedasticity and no autocorrelation were not violated using random effect. Also, random effect was the most appropriate model in analysing the relationship between firm attributes and RAM. Table 4.5 reported the results of the three models. The r-square of the model showed that about 49.1% of the sources of variation in the RAM of the sampled firms in Nigeria were accounted for by the independent variables. Moreover, after adjusting for the loss in degree of freedom, the r-square reduced to 38.4%. The f-statistics reported the joint significance of all the variables. The result of the f-statistics 12.4530 showed that the model was significant. The result implied that the model was statistically significant and the coefficients were jointly different from zero.

Capital intensity (CAPINT) had increasing impact on the RAM of the firms with magnitude of 0.7919, t-value of 6.5300 and p-value < 0.05. It showed that capital intensity exhibited statistical cogent relationship with the RAM, thereby rejecting H_{01} . The result indicated that high capital intensity firms tended to have increasing or high RAM. More so, profitability of firms had drawdown effect on the RAM of the sampled non-financial firms with coefficient of -0.8494, t-value of -5.0709 and p-value < 0.05. Profitability had negative relationship with the RAM of the quoted non-financial firms. The result of the t-value indicated that profitability is statistically cogent at 5% level of significance, thus rejecting H_{03} . The outcome implied that favourable profitability would reduce RAM among the firms.

Furthermore, leverage of the firm exhibited positive relationship with the RAM of the quoted non-financial firms. Leverage had positive effect on the RAM with the coefficient of 0.0139. The t-value and p-value of the leverage indicated that the variable was statistically significant with t-value of 3.0581 and p-value < 0.05. It was an indication that increase in the leverage would bring about increase in RAM. Jelinek (2007) examined the effect of leverage increases on EM across a five-year sample period for firms that undergo leverage increases and a control group of consistently highly leveraged firms in United States of America. The study findings revealed that increased leverage was associated with a reduction in EM, and that growth and free cash flow levels were factors influencing this relationship.

In associating with RAM, firm age had coefficient of 0.0012, t-value of 1.2582 and p-value > 0.05. This implied that although the association between firm age and RAM was positive, it was not statistically cogent. The influence of company largeness on RAM was positive and statistically not cogent, thereby accepting H_{02} (coefficient = 0.0115, t-value = 0.5072, and p-value > 0.05). The relationship between liquidity of firms and RAM was positive but it was not statistically cogent (coefficient = 0.0012, t-value = 0.1997, and p-value > 0.05).

Table 4.5: Parameter Estimate of the Effect of Firms Attributes on Real Activity Manipulation (RAM)

Variable	Dependent Var. RAM								
	Pooled OLS			Fixed Effect Model			Random Effect Model		
	Coef.	t-value	p-value	Coef.	t-value	p-value	Coef.	t-value	p-value
CAPINT	0.6593	5.5744	0.0000	0.8321	6.6255	0.0000	0.7919	6.5300	0.0000
AGE	0.0017	1.5518	0.1210	0.0011	1.1402	0.2545	0.0012	1.2582	0.2086
FSIZE	0.0337	1.6709	0.0950	0.0022	0.0925	0.9263	0.0115	0.5072	0.6121
PROF	-0.9083	-5.2510	0.0000	-0.8356	-4.9041	0.0000	-0.8494	-5.0709	0.0000
AG	-0.0763	-3.9105	0.0001	-0.0773	-4.1459	0.0000	-0.0774	-4.1965	0.0000
LEV	0.0142	2.9512	0.0032	0.0137	2.9851	0.0029	0.0139	3.0581	0.0023
LIQ	0.0027	0.4034	0.6867	0.0007	0.1141	0.9091	0.0012	0.1997	0.8417
SG	-0.0052	-0.2305	0.8177	-0.0044	-0.2027	0.8394	-0.0048	-0.2222	0.8242
C	-0.8548	-2.5477	0.0110	-0.3997	-0.9848	0.3249	-0.5360	-1.3910	0.1645
R-squared	0.0792			0.2876			0.4914		
Adjusted R-squared	0.0717			0.2397			0.3840		
f-value	10.6451			5.9943			12.4530		
P(f-value)	0.0000			0.0000			0.0000		

Post Estimation Test	
Serial correlation	5.8699 (p=0.1907)
Hausman Test	5.1094 (p=0.7458)
Heteroskedasticity	1.0548 (p=0.8937)

Source: Author's Computation (2023)

Discussion of Findings

Firm attributes, as a whole, jointly had significant effect on RAM of listed Nigerian non-financial firms. With respect to the effects of capital intensity on RAM, the study found that capital intensity had favourable and cogent effect on the RAM (coefficient = 0.7919, t-value = 6.5300 and p-value < 0.05). The results implied that high capital intensity firms tended to have high RAM. These findings were in agreement with the evidence provided by Edi and Jessica (2020) that discovered that firm characteristics accentuated the EM behaviour cogently. The findings were also supported by Agency theory prediction that managers of firms with large non-current assets base would invariably have large buffer to manipulate earnings.

Furthermore, the study found that the effect of company largeness on RAM was favourable (coefficient = 0.0115). This implied that increase in company largeness will lead to an increase in RAM. The effect of company largeness on RAM was not cogent (t-value = 0.5072, p-value > 0.05). The implication of these findings was that, in the context of listed Nigerian NFC, big firms tended to increase RAM. These results of the study agreed with Chudia, Cruz and Estabillo (2021) whose findings revealed that company largeness was a statistically cogent predictor of EM for property firms in Philippines.

Also, the study investigated the influence of profitability of public Nigerian NFC on RAM practices. It found that profitability influence on RAM was adverse (coefficient = -0.8494) and statistically cogent (t-value = -5.0709, p-value < 0.05). This implied that public Nigerian NFC that were more profitable tended to decrease RAM. These empirical evidences of the study were in line with Purnama, Nurdiniah and Bisnis (2018) whose result showed that profitability had a favourable effect on EM.

Another firm attribute examined by the study was financial leverage. The study found that the influence of financial leverage on RAM was favourable (coefficient = 0.0139) and cogent (t-value = 3.0581, p-value < 0.05). This implied that public Nigerian NFC with increasing financial leverage tended to increase RAM. These study findings disagreed with Al Matbouly (2021) whose findings showed that highly leverage companies engaged more in AEM than the RAM.

As regards liquidity (current ratio) and RAM, the study found that the effect of current ratio on RAM (coefficient = 0.0012, t-value = 0.1997, p-value > 0.05) in public Nigerian NFC was favourable and not cogent. These study findings on the effects of current ratio on RAM corroborated Okika, Omoregbee and Echobu (2020) whose results showed that current ratio had favourable cogent effects on EM of public conglomerate firms in Nigeria. It was worthy of note that these study findings were at variance with the results of Cuong and Ha (2018) that current ratio had significant influence on the EM of public companies in Vietnam.

Lastly, the study evidence further revealed that firm age had favourable effect on RAM (coefficient = 0.0012). However, the effect of firm age on RAM was not cogent (t-value = 1.2582, p-value > 0.05). These implied that as firm age increases, RAM also increases. In other words, older firms tend to engage in RAM practices than younger firms. These study findings partially agreed with Al Matbouly (2021) who found that the relationship was insignificant between both forms of EM and the company age.

Summary, Conclusions and Recommendations

Summary

This study's goal was to investigate the association between firm characteristics and RAM across Nigerian public NFC from 2003 to 2020. The audited financial statements of the non-financial public

firms in Nigeria as well as the facts-book of the NSE served as the study's primary sources of secondary data. To describe the statistical characteristics of the variables, descriptive statistics were used. Given the nature of the data series, the study used econometric analysis techniques and performed a number of tests, including the Panel Unit Root Test, Multi-Collinearity Test, VIF, Hausman, and Heteroskedasticity Test, as well as multiple regressions to estimate the model coefficients.

Several empirical literatures were perused to verify the results of previous researchers such as Egbunike, Igbinovia, Okafor and Mmadubuobi (2023), Kabwe (2023), Irom, Okpanachi, Ahmed and Agbi (2023), Naz and Sheikh (2023), Saliha, Naziha and Nesrine (2022), Saheed and Babatunde (2022), and Efenyumi and Okoye (2022) on the effect of firms attributes on the RAM among the public companies. Drawing from the result of the relationship between firm attributes and RAM practices among Nigerian public NFC, the outcomes of the analysis showed that all the measures of the firm attributes were essential in affecting the RAM of the firm. With the RAM, the study found that capital intensity, and total debt divided by total asset ratio effects were favourable and cogent; company largeness, firm age and current ratio effects were favourable and not cogent; profitability effect was adverse and cogent.

Conclusions

Based upon the empirical results of this study, it can be concluded that: (i) capital intensity had favourable and cogent effect on the RAM of public Nigerian NFC; (ii) the influence of company largeness on the RAM of public NFC in Nigeria was favourable and statistically not cogent; and (iii) profitability adversely and cogently affected RAM of selected public NFC in Nigeria.

Recommendations

Based on the conclusions of this study, it was recommended that: (i) Capital intensity should be aided among the firms, because it would place them on sound investment framework; (ii) based upon the study's findings that big firms were less likely to engage in EM, the government of Nigeria should promote the growth of public Nigerian NFC by providing better and more infrastructural facilities; and (iii) since profitability adversely and cogently affected RAM, Financial Reporting Council of Nigeria should monitor and scrutinise the annual reports and accounts of NFC that are declaring increasing profits before tax.

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